

REMARKS

The Office Action of November 4, 2003 presents the examination of claims 1-8 and 10-28. The present paper amends claims 1, 4, 7, 16-19, 21-22 and 25.

A telephone interview was held with the Examiner on October 30, 2003. In that discussion, the Examiner proposed numerous changes to the claims that were indicated would place the claims into condition for allowance. The present Office Action was issued in view of Applicants' Representative's inability to confirm the proposed changes before the Examiner was required to act on the application.

The present paper amends the claims in the manner suggested by the Examiner to place the claims into condition for allowance. Applicants nevertheless address the rejections posed in the Office Action below.

Rejection under 35 USC § 112, second paragraph

Claim 16 is rejected under 35 USC § 112, second paragraph. The Examiner indicates that the phrase, "capable of exhibiting electrical conductivity" is indefinite. At the Examiner's suggestion, claim 16, and also claim 1 which recites the same phrase, are amended to recite that the material is "intrinsically electrically conductive", thus obviating this rejection. The

Examiner admits that the specification describes a range of 10^6 to 10^{10} ohms/sq cm as a range that the ordinary artisan would take to be "electrically conductive" and therefore the instant claims are not indefinite in this recitation.

Though broad, terms of the instant claims 1 and 16 are not indefinite. The Examiner's comment that, "the specification does not provide guidance on what materials are included in this phrase" is not understood. Guidance by the specification is not determinative of the meaning of terms in claims. The issue under this section of the statute is whether one of ordinary skill in the art can understand what is within the claims and what falls outside of them. Terms in a claim are generally given their ordinary meaning, or an express definition in the specification. Applicants submit that the present claims are well understood by the skilled artisan, especially in view of the admission by the Examiner that exemplary values of "electrical conductivity" are provided by the specification. Thus, the instant rejection should be withdrawn.

Rejections over prior art

The following rejections have been maintained for reasons of record:

Claims 1, 8, 10-15, 17-18, 21 and 26-28 stand rejected under 35 USC § 102(b) as anticipated by Natsuko et al. JP '828.

Claims 1, 8, 15, 18 and 26 stand rejected under 35 USC § 102(b)/103(a) as anticipated by or obvious over Kumiko JP '540.

Claims 1, 8 and 15 stand rejected under 35 USC § 102(b)/103(a) as anticipated by or obvious over Sammells '817.

Claims 1, 8, 10-15, 17-18, 21 and 26 stand rejected under 35 USC § 102(b)/103(a) as anticipated by or obvious over Allemand '717.

Claims 1-8, 10-15, 17-21 and 23-26 stand rejected under 35 USC § 103(a) as obvious over Sammells '817 or Allemand '717 in view of Yu '338.

Claims 1-6, 8, 10-115, 17-21, 23-24 and 26 stand rejected under 35 USC § 103(a) as obvious over Natsuko JP '828 in view of Hidetsugu JP '691 or Seikushi JP'183.

Applicants have previously addressed each of these rejections in their response filed August 20, 2003.

The essential difference between the present invention and the various references cited above, either alone or in their combinations, is that the above references fail to teach a material that becomes intrinsically conductive upon treatment with a viologen salt. The Examiner has apparently accepted this, as he proposed amendment of the claims to recite this feature in the claims to place them into condition for allowance.

The Examiner seems to feel that there may not be evidence in the record that the polymers of the instant invention are not, in the manner of the polymers of Natsuko, simply porous materials having voids filled by conductive viologen. In this regard, Applicants again point out that materials prepared by Zhou et al., Exhibit 1, are similar to the working examples of the instant specification and are washed after treatment with a viologen salt. Applicants submit that such washing would remove any ionic material, such as viologen salt, that merely occupied pores in the base polymer. The retention of conductivity despite such washing is evidence that the base polymer has reacted with the viologen to form an intrinsically conductive material. Applicants do not understand the Examiner's comment that Zhou et al. only describe experiments performed with polyaniline and a viologen salt.

Applicants do take note of the "position of the office that neither the porosity nor the mechanism of imparting electrical conductivity is a limitation of the instant claims". Applicants note that the term "intrinsically conductive" clearly distinguishes the instant invention over the various alternatives, in which polymers are merely hosts for electrolytes, and thus heterogeneity (i.e. a two-phase system) is required for the materials to be conductive, described in the cited references. This is in contrast to the materials of the instant invention, which conduct

electric current intrinsically. The Examiner might note the figures of Schemes 1 and 2 of Zhou et al., Exhibit 1, which shows the formation of a polyaniline molecular radical species, i.e., a free electron able to migrate along the polyaniline as a charge carrier, as a product of the reaction of polyaniline with viologen salt in the presence of oxygen. Thus, the overall result of the "oxidative doping" described in the specification is a polymeric material that includes free radical electrons as intrinsic charge carriers. Such are distinct from the materials described in the cited references.

Applicants note the Examiner's apparent request for evidence that the material of Natsuko is indeed a porous one. Such evidence comes from the reference itself; Applicants again point to page 4 of the translation provided by the Examiner which, as mentioned before, so describes Natsuko's material. The material of Kumiko is similarly described in the abstract of that reference.

Sammells' discussion of viologens is in the context of an aqueous electrolyte solution. Sammells notes that the action of heptylviologen is dependent upon the presence of specific anions, cations, and metals (col. 2, lines 16-17). Furthermore, notwithstanding the Examiner's view, Sammells characterizes his invention as having, "a water soluble organic electrochromic material dissolved in water associated with a water containing

ionically conducting polymer electrolyte ..." (col. 2, lines 56-60). "A supporting polymer electrolyte within the ionically conducting polymer layer is to provide high overall ionic conductivity in the final cell" (col. 3, lines 4-8). Thus, the conducting materials in Sammells are ions, not the polymer molecules themselves.

Allemand is also reliant upon a separate electrolyte phase for conductivity. See, e.g. col. 4, line 67. Again, ions other than the polymeric material are the conductive moieties. See, e.g. col. 6, lines 1-6.

For all of the above reasons, and those provided in their paper of August 20, 2003, Applicants submit that the instantly claimed invention is free of the prior art rejections of record.

The present application well-describes and claims patentable subject matter. The favorable action of allowance of the pending claims and passage of the application to issue is respectfully requested.


Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Mark J. Nuell (Reg. No. 36,623) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Appl. No. 09/828,924

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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